

STIC Biotechnology Systems Branch

RAW SEQUENCE LISTING **ERROR REPORT**

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: 10/797,553C
Source: STIC
Date Processed by STIC: 8/29/05

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
- 2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, TELEPHONE: 571-272-2510; FAX: 571-273-0221

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE **CHECKER VERSION 4.2.2 PROGRAM**, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

<http://www.uspto.gov/web/offices/pac/checker/chkrnote.htm>

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail. Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom. Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<<http://www.uspto.gov/ebc/efs/downloads/documents.htm>> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry, Federal Express, United Parcel Service, or other delivery service (EFFECTIVE 01/14/05):
U.S. Patent and Trademark Office, Mail Stop Sequence, Customer Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314

Revised 01/24/05

Raw Sequence Listing Error Summary

ERROR DETECTED

SUGGESTED CORRECTION

SERIAL NUMBER:

10/797, JJ3C

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

- 1 Wrapped Nucleics
 Wrapped Aminos The number/text at the end of each line "wrapped" down to the next line. This may occur if your file was retrieved in a word processor **after** creating it. Please adjust your right margin to .3; this will prevent "wrapping."
 - 2 Invalid Line Length The rules require that a line **not exceed** 72 characters in length. This includes white spaces.
 - 3 ✓ Misaligned Amino
 Numbering The numbering under each 5th amino acid is misaligned. Do **not** use tab codes between numbers; use **space characters**, instead.
 - 4 Non-ASCII The submitted file was **not** saved in ASCII(DOS) text, as **required** by the Sequence Rules. **Please ensure your subsequent submission is saved in ASCII text.**
 - 5 ✓ Variable Length Sequence(s) 56 contain n's or Xaa's representing more than one residue. **Per Sequence Rules, each n or Xaa can only represent a single residue.** Please present the **maximum** number of each residue having variable length and indicate in the <220>-<223> section that some may be missing.
 - 6 PatentIn 2.0
 "bug" A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid sequences(s) . Normally, PatentIn would automatically generate this section from the previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to the subsequent amino acid sequence. **This applies to the mandatory <220>-<223> sections for Artificial or Unknown sequences.**
 - 7 Skipped Sequences Sequence(s) missing. If intentional, please insert the following lines for **each** skipped sequence:
(OLD RULES) (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
 (i) SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading)
 (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
 This sequence is intentionally skipped

 Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to **include** the skipped sequences.
 - 8 Skipped Sequences Sequence(s) missing. If **intentional**, please insert the following lines for **each** skipped sequence.
(NEW RULES) <210> sequence id number
 <400> sequence id number
 000
 - 9 Use of n's or Xaa's Use of n's and/or Xaa's have been detected in the Sequence Listing.
(NEW RULES) Per 1.823 of Sequence Rules, use of <220>-<223> is **MANDATORY** if n's or Xaa's are present.
 In <220> to <223> section, please explain location of **n** or **Xaa**, and which residue **n** or **Xaa** represents.
 - 10 Invalid <213> Per 1.823 of Sequence Rules, the only **valid** <213> responses are: Unknown, Artificial Sequence, or
 Response scientific name (Genus/species). <220>-<223> section is **required** when <213> response is Unknown or
 is Artificial Sequence
 - 11 Use of <220> Sequence(s) missing the <220> "Feature" and associated numeric identifiers and responses.
 Use of <220> to <223> is **MANDATORY** if <213> "Organism" response is "Artificial Sequence" or
 "Unknown." Please explain source of genetic material in <220> to <223> section.
 (See "Federal Register," 06/01/1998, Vol. 63, No. 104, pp. 29631-32) (Sec. 1.823 of Sequence Rules)
 - 12 PatentIn 2.0 Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file,
 "bug" resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence
 listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.
 - 13 Misuse of n/Xaa "n" can **only** represent a single nucleotide; "Xaa" can **only** represent a single amino acid



IFWO

RAW SEQUENCE LISTING

DATE: 08/29/2005

PATENT APPLICATION: US/10/797,553C

TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

3 <110> APPLICANT: Moyle, William R.
 4 Xing, Yongna
 6 <120> TITLE OF INVENTION: Protein Knobs
 8 <130> FILE REFERENCE: 1092/US PCT
 10 <140> CURRENT APPLICATION NUMBER: 10/797,553C
 11 <141> CURRENT FILING DATE: 2004-03-10
 13 <160> NUMBER OF SEQ ID NOS: 66
 15 <170> SOFTWARE: PatentIn version 3.1

Does Not Comply
Corrected Diskette Needed

(Pg. 1-10) ↻

ERRORED SEQUENCES

1163 <210> SEQ ID NO: 36
 1164 <211> LENGTH: 145
 1165 <212> TYPE: PRT
 1166 <213> ORGANISM: Homo sapiens
 1168 <400> SEQUENCE: 36
 1170 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1171 1 5 10 15
 1174 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1175 20 25 30
 1178 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1179 35 40 45
 1182 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1183 50 55 60
 1186 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1187 65 70 75 80
 1190 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1191 85 90 95
 1194 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1195 100 105 110
 1198 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Ser Leu
 1199 115 120 125
 1202 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 E--> 1203 130 135 140 145
 1206 <210> SEQ ID NO: 37
 1207 <211> LENGTH: 145
 1208 <212> TYPE: PRT
 1209 <213> ORGANISM: Artificial Sequence
 1211 <220> FEATURE:
 1212 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser138
 1214 <400> SEQUENCE: 37
 1216 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu

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Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

```

1217 1          5          10          15
1220 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1221          20          25          30
1224 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1225          35          40          45
1228 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1229          50          55          60
1232 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1233 65          70          75          80
1236 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1237          85          90          95
1240 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1241          100         105         110
1244 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1245          115         120         125
1248 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1249      130      135      140
1252 <210> SEQ ID NO: 38
1253 <211> LENGTH: 145
1254 <212> TYPE: PRT
1255 <213> ORGANISM: Artificial Sequence
1257 <220> FEATURE:
1258 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b
1259      eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
1260      8
1262 <400> SEQUENCE: 38
1264 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1265 1          5          10          15
1268 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1269          20          25          30
1272 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1273          35          40          45
1276 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1277          50          55          60
1280 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1281 65          70          75          80
1284 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1285          85          90          95
1288 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1289          100         105         110
1292 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1293          115         120         125
1296 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 1297      130      135      140
1300 <210> SEQ ID NO: 39
1301 <211> LENGTH: 145
1302 <212> TYPE: PRT
1303 <213> ORGANISM: Artificial Sequence
1305 <220> FEATURE:

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Input Set : A:\SEQUENCE LISTING.1092.txt

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1306 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their hFSH b

1307 eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
 1308 8, and Serine38 in the beta-subunit carboxyterminus of this
 1309 analog was replaced with Cys

1311 <400> SEQUENCE: 39

1313 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu

1314 1 5 10 15

1317 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr

1318 20 25 30

1321 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val

1322 35 40 45

1325 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe

1326 50 55 60

1329 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val

1330 65 70 75 80

1333 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser

1334 85 90 95

1337 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe

1338 100 105 110

1341 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu

1342 115 120 125

1345 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln

E--> 1346 130 135 140 145

1709 <210> SEQ ID NO: 45

1710 <211> LENGTH: 125

1711 <212> TYPE: PRT

1712 <213> ORGANISM: Artificial Sequence

1714 <220> FEATURE:

1715 <223> OTHER INFORMATION: hCGbeta,delta116-135,S138C

1717 <400> SEQUENCE: 45

1719 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu

1720 1 5 10 15

1723 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr

1724 20 25 30

1727 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val

1728 35 40 45

1731 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe

1732 50 55 60

1735 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val

1736 65 70 75 80

1739 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser

1740 85 90 95

1743 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp

1744 100 105 110

1747 Pro Arg Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln

E--> 1748 115 120 125

1843 <210> SEQ ID NO: 48

1844 <211> LENGTH: 140

1845 <212> TYPE: PRT

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Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

1846 <213> ORGANISM: Artificial Sequence
 1848 <220> FEATURE:
 1849 <223> OTHER INFORMATION: hCgbeta,delta131-135,S138C
 1851 <400> SEQUENCE: 48
 1853 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1854 1 5 10 15
 1857 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1858 20 25 30
 1861 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1862 35 40 45
 1865 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1866 50 55 60
 1869 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1870 65 70 75 80
 1873 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1874 85 90 95
 1877 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1878 100 105 110
 1881 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 1882 115 120 125
 1885 Pro Ser Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln

E--> 1886 130 135 140

2123 <210> SEQ ID NO: 56
 2124 <211> LENGTH: 10
 2125 <212> TYPE: PRT
 2126 <213> ORGANISM: Artificial Sequence
 2128 <220> FEATURE:
 2129 <223> OTHER INFORMATION: X1-Asp-Asp-Asp-Asp-Lys-Ser-Ym-Cys-Zn, where X, Y, and Z
 refer to
 2130 any tail portion amino acids and l, m, and n refer to the lengths
 2131 of the tail portion amino acids
 2133 <220> FEATURE:
 2134 <221> NAME/KEY: MISC_FEATURE
 2135 <223> OTHER INFORMATION: Xaa refers to any tail portion amino acids and n refers to
 the
 2136 lengths of the tail portion amino acids
 2140 <400> SEQUENCE: 56
 E--> 2142 Xaa¹ Asp Asp Asp Asp Lys Ser Xaa¹⁰ Cys Xaa¹⁰
 E--> 2143 1 5 10
 2147 <210> SEQ ID NO: 57
 2148 <211> LENGTH: 92
 2149 <212> TYPE: PRT
 C--> 2150 <213> ORGANISM: Artificial Sequence
 2152 <220> FEATURE:
 2153 <223> OTHER INFORMATION: An hCG truncated (-subunit analog fused to the hCG alpha-
 carboxy terminus
 2155 <400> SEQUENCE: 57
 2157 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 2158 1 5 10 15
 2160 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2161 20 25 30
 2163 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu

Handwritten notes:
 - p/s explain source of genetic material.
 - see item #5 on error summary sheet.
 - 'N's' are not permitted in the sequence.
 - These amino acids are misaligned, p/s see item #3 on error summary sheet.
 - 107 found
 - space

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TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

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2164          35          40          45
2166 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2167          50          55          60
2169 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2170 65          70          75          80
2172 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Asp Asp Pro Arg
E--> 2173 85 90 85 90 90 98
2175 Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 2176 100 105 100 165
2178 <210> SEQ ID NO: 58
2179 <211> LENGTH: 145
2180 <212> TYPE: PRT
2181 <213> ORGANISM: Artificial Sequence
2183 <220> FEATURE:
2184 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg94
2186 <400> SEQUENCE: 58
2188 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2189 1          5          10          15
2192 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2193          20          25          30
2196 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2197          35          40          45
2200 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2201          50          55          60
2204 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2205 65          70          75          80
2208 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Cys Arg Ser
2209          85          90          95
2212 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2213          100          105          110
2216 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2217          115          120          125
2220 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2221 130 135 140
2224 <210> SEQ ID NO: 59
2225 <211> LENGTH: 145
2226 <212> TYPE: PRT
2227 <213> ORGANISM: Artificial Sequence
2229 <220> FEATURE:
2230 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg95
2232 <400> SEQUENCE: 59
2234 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2235 1          5          10          15
2238 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2239          20          25          30
2242 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2243          35          40          45
2246 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2247          50          55          60

```

← misaligned numbering

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Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

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2250 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2251 65 70 75 80
2254 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Cys Ser
2255 85 90 95
2258 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2259 100 105 110
2262 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Ser Leu
2263 115 120 125
2266 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2267 130 135 140 145
2270 <210> SEQ ID NO: 60
2271 <211> LENGTH: 145
2272 <212> TYPE: PRT
2273 <213> ORGANISM: Artificial Sequence
2275 <220> FEATURE:
2276 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96
2278 <400> SEQUENCE: 60
2280 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2281 1 5 10 15
2284 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2285 20 25 30
2288 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2289 35 40 45
2292 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2293 50 55 60
2296 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2297 65 70 75 80
2300 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
2301 85 90 95
2304 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2305 100 105 110
2308 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2309 115 120 125
2312 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2313 130 135 140 145
2315 <210> SEQ ID NO: 61
2316 <211> LENGTH: 145
2317 <212> TYPE: PRT
2318 <213> ORGANISM: Artificial Sequence
2320 <220> FEATURE:
2321 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr97
2323 <400> SEQUENCE: 61
2325 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2326 1 5 10 15
2329 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2330 20 25 30
2333 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2334 35 40 45
2337 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe

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Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

```

2338      50      55      60
2341 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2342 65      70      75      80
2345 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2346      85      90      95
2349 Cys Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2350      100      105      110
2353 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Ser Leu
2354      115      120      125
2357 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2358      130      135      140
2360 <210> SEQ ID NO: 62
2361 <211> LENGTH: 145
2362 <212> TYPE: PRT
2363 <213> ORGANISM: Artificial Sequence
2365 <220> FEATURE:
2366 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr98
2368 <400> SEQUENCE: 62
2370 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2371 1      5      10      15
2374 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2375      20      25      30
2378 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2379      35      40      45
2382 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2383      50      55      60
2386 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2387 65      70      75      80
2390 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2391      85      90      95
2394 Thr Cys Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2395      100      105      110
2398 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2399      115      120      125
2402 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2403      130      135      140
2405 <210> SEQ ID NO: 63
2406 <211> LENGTH: 145
2407 <212> TYPE: PRT
2408 <213> ORGANISM: Artificial Sequence
2410 <220> FEATURE:
2411 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Asp99
2413 <400> SEQUENCE: 63
2415 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2416 1      5      10      15
2419 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2420      20      25      30
2423 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2424      35      40      45

```

RAW SEQUENCE LISTING

DATE: 08/29/2005

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Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

2427 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 2428 50 55 60
 2431 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
 2432 65 70 75 80
 2435 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 2436 85 90 95
 2439 Thr Thr Cys Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 2440 100 105 110
 2443 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Ser Leu
 2444 115 120 125
 2447 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 E--> 2448 130 135 140 145
 2450 <210> SEQ ID NO: 64
 2451 <211> LENGTH: 95
 2452 <212> TYPE: PRT
 C--> 2453 <213> ORGANISM: Artificial Sequence
 2455 <220> FEATURE:
 2456 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Gly-Gly-Cys at its
 carboxy terminus
 2458 <400> SEQUENCE: 64
 2460 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 2461 1 5 10 15
 2463 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2464 20 25 30
 2466 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 2467 35 40 45
 2469 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 2470 50 55 60
 2472 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 2473 65 70 75 80
 2475 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Gly Gly Cys
 E--> 2476 85 90 95
 2479 <210> SEQ ID NO: 65
 2480 <211> LENGTH: 92
 2481 <212> TYPE: PRT
 C--> 2482 <213> ORGANISM: Artificial Sequence
 2484 <220> FEATURE:
 2485 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Asp in place of Asn52 and
 Cys in place of Ser92
 2487 <400> SEQUENCE: 65
 2489 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 2490 1 5 10 15
 2492 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2493 20 25 30
 2495 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 2496 35 40 45
 2498 Val Gln Lys Asp Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 2499 50 55 60
 2501 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 2502 65 70 75 80
 2504 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

RAW SEQUENCE LISTING

DATE: 08/29/2005

PATENT APPLICATION: US/10/797,553C

TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

E--> 2505 87 90
2508 <210> SEQ ID NO: 66
2509 <211> LENGTH: 145
2510 <212> TYPE: PRT
2511 <213> ORGANISM: Artificial Sequence
2513 <220> FEATURE:
2514 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96 and hFSH
beta-subunit residues 95-108 for hCG beta-subunit residues 101-108
2516 <400> SEQUENCE: 66
2518 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2519 1 5 10 15
2522 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2523 20 25 30
2526 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2527 35 40 45
2530 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2531 50 55 60
2534 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2535 65 70 75 80
2538 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
2539 85 90 95
2542 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
2543 100 105 110
2546 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2547 115 120 125
2550 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2551 130 135 140
E--> 2554 4

pls delete

145

<210> 8
 <211> 92
 <212> PRT
 <213> Artificial Sequence

<220>

<223> hCG alpha-subunit with Cys substituted for Leu22

<400> 8

Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Cys Gln Glu Asn Pro
 1 5 10 15

Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 20 25 30

Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 35 40 45

Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 50 55 60

Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 65 70 75 80

Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
 85 90

Gly is at this location.

The type of errors shown exist throughout
 the Sequence Listing. Please check subsequent
 sequences for similar errors.

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

Invalid Line Length:

The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:57; Line(s) 2153

Seq#:65; Line(s) 2485

Seq#:66; Line(s) 2514

VARIABLE LOCATION SUMMARY

DATE: 08/29/2005

PATENT APPLICATION: US/10/797,553C

TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

Use of n's or Xaa's (NEW RULES):

Use of n's and/or Xaa's have been detected in the Sequence Listing.

Use of <220> to <223> is MANDATORY if n's or Xaa's are present.

in <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

VERIFICATION SUMMARY

DATE: 08/29/2005

PATENT APPLICATION: US/10/797,553C

TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt

Output Set: N:\CRF4\08292005\J797553C.raw

L:1203 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:36
 L:1249 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:37
 L:1297 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:38
 L:1346 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:39
 L:1748 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:45
 L:1886 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:48
 L:2142 M:258 W: Mandatory Feature missing, <222> Tag not found for SEQ ID#:56
 L:2142 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0
 L:2142 M:333 E: Wrong sequence grouping, Amino acids not in groups!
 L:2143 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:56
 L:2150 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:57
 L:2173 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:57
 M:332 Repeated in SeqNo=57
 L:2176 M:252 E: No. of Seq. differs, <211> LENGTH:Input:92 Found:107 SEQ:57
 L:2221 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:58
 L:2267 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:59
 L:2313 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:60
 L:2358 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:61
 L:2403 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:62
 L:2448 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:63
 L:2453 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:64
 L:2476 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:64
 L:2482 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:65
 L:2505 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:65
 L:2551 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:66
 M:332 Repeated in SeqNo=66